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Polymer wrapped carbon nanotubes doing it all: from
selection to self-assembly of
semiconducting devices

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One of the most promising nano-materials for
eventual incorporation into practical technologies is the
single-walled carbon nanotube (SWNT). Although several
solubilization and isolation methods for individual
SWNTs have been recently reported, programmed self
assembly of this superb material is a serious limit to
further develop their use in technology.

Here I will show a flexible and potentially
scalable solution meeting these needs using DNA block
copolymers consisting of a single-stranded DNA block
covalently connected to a hydrophobic polymer segment.
This combination of materials enables each to contribute
its full potential to the utilization of SWNTs in electronic
devices. While the conjugated portion is able to select few
semiconducting species, the DNA portion allows
immobilizing the SWNTs in specific pre-determined
position. The superiority of this self-assembly method is
shown by the high-yield (98%) of working device
fabricated.